

# ALS Part 1 Safe Life Items

**AMP Reference:** IAL/330/T Revision 00 Initial

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## 1. GENERAL

The ALS Part 1 provides mandatory instructions and airworthiness limitations for the “safe-life” structure, i.e.: structure for which the damage tolerance concept is impractical. These airworthiness limitations are established as necessary to prevent catastrophic failure and shall be complied with, as per EASA Part M.A.302 – Aircraft Maintenance Program. They are coming from the damage tolerance and fatigue evaluation of the structure.

## 2. APPLICABILITY

The A330 ALS Part 1 applies to the following aircraft series, models and Weight Variants (WV):

Aircraft Series	Aircraft Models	WV
A330-300	A330-343	020, 022, 024, 030, 031, 032, 033, 034, 035, 039, 050, 052, 054, 055, 056, 057, 058, 080, 081, 082, 083

### WEIGHT VARIANT (WV) APPLICABILITY

The list of the approved WV is provided in the Type Certification Data Sheet (TCDS) N° A.004 issued by the EASA, together with associated modification configuration(s).

To determine the applicable WV at the time of aircraft delivery, refer to the list of modifications embodied during production, provided to the initial Operator of the aircraft, in the delivery documentation (Aircraft Inspection Report ‘Conformity to Design Standard Requirements’).

A WV status may change as a result of the embodiment of Airbus’ SB.

Note 1: APPENDIX C reminds the modifications and operational weights associated to the approved WV.

Operators that utilize aircraft which embody modification introducing Multiple Weight Variants (MWVs) must always use the airworthiness limitations belonging to the WV that has the most restrictive airworthiness limitations, even when switching from the most restrictive WV to a less restrictive WV, unless otherwise stated.

In case a modification introduces a new WV (not listed in the above table), the instructions and airworthiness limitations applicable to the associated model and WV series apply to this new WV, except otherwise mentioned in a specific variation (linked to this modification).

The WV applicability table will reflect the new WV in the next ALS Revision.

Ex: mod X introduces WV087 for the models A330-243 and A330-343.

A330-243 aircraft embodying mod X have to apply the instructions and airworthiness limitations applicable to the A330-2xx model and WV08x series, even if WV087 is not listed in the above table.

Similarly, A330-343 aircraft embodying mod X have to apply the instructions and airworthiness limitations applicable to the A330-3xx model and WV08x series, even if WV087 is not listed in the above table.

### 3. DEFINITION OF ALS PART 1 CONTENT

#### 3.1 LIFE LIMITS (LL)

ALS Part 1 manual contains, in SECTION 4, components having a life limit due to failure during fatigue tests. Their Part Numbers (PNR) are labelled “LL” in the table.

#### 3.2 DEMONSTRATED FATIGUE LIVES (DF)

ALS Part 1 manual contains, in SECTION 4, components having a demonstrated fatigue life without failure. Their PNR are labelled “DF” in the table.

For these components, the life limitation provided (in usage parameters, e.g.: Flight Hours, Landings, etc. as applicable) may evolve depending on fatigue tests result. If the component fails, its Part Number (PNR) will be at last labelled “LL” in the table.

### 4. BASIC RULES

#### 4.1 CLOCK STARTING POINT FOR SAFE LIFE ALI

The starting point is the date at which the component accomplishes the first flight for which it will undertake its intended function, unless otherwise stated.

The life limitation for a PNR is to be counted from the first flight of the component, unless otherwise stated.

Note: The clock is not reset for in-service PNR evolution, unless otherwise stated.

#### 4.2 TRACEABILITY

Safe Life Airworthiness Limitation Items (SL-ALI) have to be considered as “service life limited components” or “life-limited parts” and therefore it is necessary to assure traceability and monitoring of these components as per EASA Part M.A.305 - Aircraft continuing airworthiness record system.

Where the complete life history of a component/item is not known, Operators are requested to refer to the In-Service Information ISI 00.05.00003 for guidance. It provides the means to manage such components/items. It has been issued in agreement with the European Aviation Safety Agency (EASA).

Note: Traceability and monitoring of “life-limited” components which are listed in SECTION 4 are not required for consumable components (for which replacement is controlled at assembly/aircraft level).

#### 4.3 REPLACEMENT REQUIREMENTS

In order to maintain aircraft airworthiness, Operators shall replace components listed under SECTION 4 at or prior to whichever of the life limitations occurs first, after any necessary adjustment of the stated life limitations in accordance with the instructions of paragraph 5.4 of this Section.

#### 4.4 TRANSFER OF PARTS BETWEEN AIRCRAFT APPLICATIONS/AIRCRAFT CONFIGURATION CHANGE

The airworthiness limitation(s) for a component fitted to an aircraft may be different when:

- The component is transferred to another application (aircraft type, aircraft model, weight variant, etc.),
- The aircraft configuration is changed as a result of MOD/SB embodiment (weight variant, landing gear standard, etc.).

In these cases, the component's remaining life must be calculated using the following formula:

$$Tr_i = \left[ 1 - \sum \left( \frac{Ca_j}{Cp_j} \right) \right] \times Cp_i$$

With:

Tri = components remaining life for operation on current application i.

Caj = components accumulated life on previous application j.

Cpj = components airworthiness limitation in previous application j.

Cpi = components airworthiness limitation in current application i.

Note 1: When using the above formula, Tri, Caj, Cpj, Cpi are expressed in the same usage parameter (e.g. FH or FC or LDG): Usage parameters cannot be mixed in the same calculation.

Note 2: The remaining life calculation must be reassessed every time the component's airworthiness limitation(s) change(s) for current and/or previous aircraft application(s) to which the component is/was fitted.

#### 4.5 DISPOSAL/QUARANTINE ACTION

When the components reach the life limitations, disposal/quarantine action shall be taken, as per EASA Part M.A.504 - Control of unserviceable components, which asks for a status of service life limited components and a service life limited components log card. Disposal/quarantine action depends on the following categories:

- For “life-limited” components labelled “LL” and listed in the SECTION 4: They shall be mutilated beyond repair limits to prevent rework to appear to be airworthy.

Note: Supplier shall be kept informed.

- For components, whose fatigue lives have been demonstrated, labelled “DF” and listed in the SECTION 4: Appropriate means shall be implemented to deter their installation on aircraft pending possible extension of their life limitations. Examples of means are:

- Record keeping system,
- Non-permanent markings,
- Segregation (components stored separately from those currently eligible for installation).

The ultimate solution is the mutilation beyond repair limits to prevent rework to appear to be airworthy, as per AMC M.A.504 – Control of unserviceable components.

Note: When consumable components are removed, they must be mutilated beyond repair limits to prevent rework to appear to be airworthy.

#### 4.6 ASSOCIATED TECHNICAL DOCUMENTATION

PNR provided by SECTION 4 relates to detail components. They may not all be listed in Illustrated Parts Catalogue (IPC) issued by Airbus.

For wing structure and landing gear components manufactured by Airbus, detail PNR are listed in the relevant Airbus engineering drawings/Component Maintenance Manual manufacturer (CMM) issued by Airbus.

For landing gears, detail PNR are listed in the relevant Illustrated Parts List (IPL)/Component Maintenance Manual (CMM) issued by vendors.

To help operators complying with the ALS Part 1, Airbus has compiled in a supporting document named “Information File” the Next Higher Assembly and procurable PNR associated to each components listed in the ALS Part 1. The Information File can be found at the same location than the ALS Part 1 itself.

### 5 PRODUCTION/ CONCESSIONS, REPAIR SOLUTIONS, ALS VARIATIONS, AIRWORTHINESS DIRECTIVES AND ALTERNATIVE METHODS OF COMPLIANCE

Limitations of the ALS Part 1 may be superseded by instructions and/or airworthiness limitations given in either a production concession, a Repair Design Approval Sheet (RDAS) or a Repair Design Approval Form (RDAF), an ALS Variation, an Alternative Method Of Compliance (AMOC), an Airworthiness Directive (AD) or exemptions provided by National Aviation Authorities (e.g. exemption supported by ASAC – Airbus Statement of Airworthiness Compliance).

When limitations change in a Revision of the ALS Part 1 subsequent to the issuance date of the production concession/repair solution/AD/AMOC, Operators are requested to contact Airbus for guidance to establish impact on the production concession/repair solution/AD/AMOC.

## 8 MODIFICATIONS/REPAIRS NOT DEVELOPED BY AIRBUS DOA

### Certificate EASA.21J.031

If an aircraft/component has a modification or repair embodied, that has not been developed under the authority of Airbus Design Organization Approval (DOA) No EASA.21J.031, and affects the content of the ALS, the Design Approval Holder (e.g. Supplementary Type Certificate (STC) holder) is responsible to provide any necessary adaptations of the ALS Part 1 airworthiness limitations.

## 9 Explanation of Table Format

The Safe Life Airworthiness Limitation Items (SL ALI) are presented in SECTION 4 of ALS Part 1. Detailed information is given below to explain tables provided on subsequent pages.

Explanation notes are located under the table.

NOMENCLATURE		PART NUMBER	LL/ DF	LIMITATIONS (Whichever occurs first)				LIMITATIONS APPLICABILITY									
								A330- 2xxF		A330-2xx				A330-3xx			
				FH	LDG	FC	Cal.	WV00x	WV02x	WV05x WV06x	WV058 WV062	WV08x	WV00x WV01x	WV02x	WV03x WV05x WV06x	WV08x	WV80x
ATA XX-XX-XX ATA NAME (FIG. XX)																	
ASSEMBLY NAME (FIG. XX)																	
SUB-ASSEMBLY NAME (FIG. XX)																	
(1) [Note 1]																	
(2) [Note 2]																	

### NOTES

Explanation notes are located under the table. When several notes are provided in the same cell the logical "AND" applies between the different configurations/conditions.

### REVISION CODE

This column provides nature of change compared to previous Revision. This information is provided at the level of the part number.

(D): Deleted (part number no more life limited)

(R): Revised (at least one change in one limitation of considered part number)

(N): New (new life limited part number introduced)

### 9.1 NOMENCLATURE

This column provides the nomenclature of the part number given on the right hand side column.

### 9.2 PART NUMBER

This column provides the part number impacted by the life limitations/demonstrated fatigue lives.

Note: SECTION 4 provides the applicable life limitations only when PNR installations have been authorized. These tables do not ensure that a PNR has been validated for a specific individual aircraft MSN. PNR are authorized for installation on individual aircraft MSN by SB (and the associated modifications), which are published by Airbus.

### 9.3 LL/DF

Components having a life limit (LL) due to failure during fatigue tests will be labelled “LL”.

Components having a demonstrated fatigue life (DF) without failure will be labelled “DF”.

### 9.4 LIMITATIONS

Life limitations quoted in SECTION 4 are applicable to the undamaged detail components as listed, not to the assembly or the aircraft on which they are installed.

Life limitations are provided in usage parameters, e.g.:

- FH: Flight Hours
- FC: Flight Cycles
- LDG: Landings
- Cal.: Calendar time in years, months, etc.

For a given PNR, when more than one set of limitations (FH/FC/Cal) is published for the same application, it is under Operator/MRO's responsibility to select the appropriate set depending on the aircraft utilization. Combining the limitations from different sets is not permitted.

### 9.5 LIMITATIONS APPLICABILITY

Applicability is allocated to aircraft affected with an “x”, according to:

#### - AIRCRAFT MODEL

Table headers indicate aircraft models. When ‘x’ is entered in the model number, it stands for any number within the limits of the list of models given in the SECTION 1, paragraph 2 APPLICABILITY, e.g.:

A330-30x stands for: A330-301, A330-302 and A330-303

Life limitation applicability is allocated according to the aircraft model affected, e.g.:

A330 stands for: All A330 models defined by the applicability of the column.

-321 stands for: A330-321 model only, defined by the applicability of the column.

-321/-341 stands for: A330-321 and A330-341 models only, defined by the applicability of the column.

Excl. -341 stands for: All A330 models defined by the applicability of the column, excluding the A330-341 model.

#### - WEIGHT VARIANT

Table headers indicate aircraft WV. When ‘x’ is entered in the WV number, it stands for any number within the limits of the list of WVs defined in the tables of SECTION 1, paragraph 2 APPLICABILITY.

#### - AIRCRAFT MANUFACTURER SERIAL NUMBER

Life limitation applicability may be allocated according to the aircraft MSN affected, e.g.: XXXXX-YYYYY stands for: From aircraft MSN XXXXX to aircraft MSN YYYYY (for all aircraft defined by the applicability of the column)



XXXXX, YYYYY stands for: For aircraft MSN XXXXX and aircraft MSN YYYYY

XXXXX stands for: For aircraft MSN XXXXX only

Excl. XXXXX stands for: For all aircraft (defined by the applicability of the column), excluding MSN XXXXX

## 10. APPENDIX C. WEIGHT VARIANTS INSTALLATIONS

A330-300 series WV050's installations

WV050: Aircraft POST MOD 51805 or POST MOD 53107.

A330-343	X		X		X	X	X	X	X	
WEIGHT VARIANT	050	051	052	053	054	055	056	057	058	059
MTOW (t)	230	212	233	205	235	235	205	184	215	217
MLW (t)	185	187	187	185	187	187	187	174	187	185
MZFW (t)	173	175	175	173	173	173/175	175	164	173	173